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Correlation between glycosylated hemoglobin level and blood pressure among 906 diabetic patients in tropical areas

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Objective: To observe the correlation between glycosylated hemoglobin level and blood pressure, and to provide clinical evidence to assist the screening and prediction of hypertension among diabetic patients in tropical setting.

Methods: A total of 906 diabetic patients who had previously received physical examination at the Second Affiliated Hospital of Hainan Medical University from January 2009 to December 2018 were selected. Retrospective case-case study method was used. The average glycosylated hemoglobin level (HbA1c) was (5.80±1.27)%, and average blood pressure level was (129±18/79±10) mmHg. Patients were divided into group A: blood glucose well controlled, HbA1c<6.5%, (58.82±12.16) years old (754 cases); and group B: blood glucose poor controlled, HbA1c≥6.5%, (60.22±11.82) years old (152 cases). There was no significant difference in age between the two groups ($T=-1.302$, $P=0.186$). T -test, χ^2 -test, spearman correlation analysis and receiver operating characteristic (ROC) curve analysis were used to observe the correlation between glycosylated hemoglobin level and blood pressure, and the prevalence of hypertension.

Results: Group B showed higher systolic blood pressure (134.19±18.62) mmHg *vs* (127.76±17.21) mmHg, diastolic blood pressure (81.82±10.92) mmHg *vs* (79.00±9.42) mmHg and blood glucose level (9.10±3.09) mmol/L *vs* (5.52±0.95) mmol/L than group A (T values were 4.335, 3.226, 14.142, respectively, P values were all <0.001). Spearman correlation analysis showed that HbA1c was positively correlated with systolic and diastolic blood pressure (the correlation coefficients r were 0.154 and 0.121, respectively, P values were all <0.001). The prevalence rates of hypertension were 31.17% (235/754) in group A, and 43.4% (66/152) in group B, and the difference was statistically significant [$\chi^2=8.562$, OR=1.695, 95% CI (1.187-2.419), $P=0.003$]. ROC curve of glycosylated hemoglobin was drawn to screen hypertension and the results showed that AUG was 0.587 [95% CI (0.548-0.626), $P<0.001$], the cut-off point, sensitivity and specificity were 6.05%, 33.6% and 78.2%, respectively.

Conclusions: There was positive correlation of glycosylated hemoglobin and blood pressure and it is a novel view of using HbA1c to screen and predict hypertension among diabetic patients in tropic settings. More researches are needed in this field.

Keywords: Glycosylated hemoglobin; Blood pressure; ROC curve

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